

WHAT IS CLAIMED:

1. A thermooptically active composition comprising:
10 to 90% by weight of a polymer fluid; and
90 to 10% by weight of a wax having a low melting point.
2. The composition of claim 1, wherein the polymer fluid is a chlorotrifluoroethylene polymer.
3. The composition of claim 1, wherein the polymer fluid is a bromotrifluoroethylene polymer.
4. The composition of claim 1, wherein the wax is a chlorotrifluoroethylene wax.
5. The composition of claim 1, wherein the wax is a bromotrifluoroethylene wax.
6. The composition of claim 1, wherein the polymer fluid is a halogenated polymer, substantially free of hydrogen-bonded species.
7. The composition of claim 1, wherein the polymer fluid is a halogenated solid which is substantially miscible in the fluid portion when melted.

8. The composition of claim 1, wherein the polymer fluid is a silicone fluid and the wax is a soluble silicone resin.

9. The composition of claim 1, wherein the fluid is a polyphenylether and the wax is a high molecular weight polymer of the same type.

10. The composition of claim 1, wherein the fluid is a polyphenylthiooxyether and the wax is a high molecular weight polymer of the same type.

11. The composition of claim 1, further comprising:

performance additives up to 5% by weight selected from the group consisting of: anti-oxidant, absorbing dye, fluorescing dye, metal scavenger, metal passivator, acid scavenger and mixtures thereof.

12. The composition of claim 1, further comprising:

particle thickening agents up to 50% by weight selected from the group consisting of: silicon dioxide powders, oxide powders, liquid crystals, fluorescent powders, microspheres, nanotubes, clays, metal powders, conductive polymers, chromophoric polymers, ceramic powders and mixtures thereof.

13. The composition of claim 11, further comprising:

particle thickening agents up to 50% by weight selected from the group consisting of: silicon dioxide powders, oxide powders, liquid crystals, fluorescent

powders, microspheres, nanotubes, clays, metal powders, conductive polymers, chromophoric polymers, ceramic powders and mixtures thereof.

14. The composition of claim 1 further comprising:

fluid thickening agents up to 20% by weight, said fluid thickening agents being soluble in the base fluid.

15. The composition of claim 11 further comprising:

fluid thickening agents up to 20% by weight, said fluid thickening agents being soluble in the base fluid.

16. The composition of claim 13 further comprising:

fluid thickening agents up to 20% by weight, said fluid thickening agents being soluble in the base fluid.

17. The composition of claim 1, wherein the fluid is comprised of a blend of two or more miscible constituent fluids.

18. The composition of claim 1, wherein the fluid is substantially free of carbon-hydrogen bonds.

19. A waveguide attenuation device comprising:

an active medium, said active medium having a microcrystalline wax phase transition from non-crystalline to semi- or fully microcrystalline at a temperature within the service temperature range of the waveguide attenuation device;

a light path within said active medium having an input end and an output end;

a housing for containing said active medium, said housing further comprising a means for inputting light from a light source into said input end of said light path and a means for directing said light from said output end of said light path;

a heating device adjacent to said housing, said heating device providing a measured amount of heat to control the transition of said active medium between said non-crystalline state, wherein said active medium prevents light transfer along said light path, and said semi- or fully microcrystalline state, wherein said active medium allows light transmission along said light path.

20. The waveguide attenuation device of claim 19, wherein said active medium has a microcrystalline structure that is substantially free of hydrogen-bonded species.

21. The waveguide attenuation device of claim 20, wherein said active medium is selected from the group consisting of chlorotrifluoroethylene wax and bromotrifluoroethylene wax.

22. The waveguide attenuation device of claim 19, wherein said active medium has a microcrystalline structure that is partially or fully halogenated wax compositions.

23. The waveguide attenuation device of claim 22, wherein said active medium is selected from the group consisting of polyalphaolefin compositions, paraffin wax compositions, hydrocarbon microcrystalline wax compositions, polypropylene compositions, siloxane resins, siloxane fluids, polyphenylether resins, polyphenylether fluids, polyphenylthioether resins and polyphenylthioether fluids.

24. A waveguide attenuation device of claim 19, wherein the active medium is held permanently within a range of temperatures which put it in a state of arbitrary fixed attenuation.

25. A waveguide attenuation device of claim 19, wherein the active medium is held permanently within a range of temperatures which put it in a state of arbitrary fixed attenuation wherein said range of attenuation further includes a state which is substantially non-attenuating.

26. The waveguide attenuation device of claim 19 wherein said active medium includes performance additives up to 5% by weight selected from the group consisting of: anti-oxidant, absorbing dye, fluorescing dye, metal scavenger, metal passivator, acid scavenger and mixtures thereof.

27. The waveguide attenuation device of claim 19 wherein said active medium includes particle thickening agents up to 50% by weight selected from the group

consisting of: silicon dioxide powders, oxide powders, liquid crystals, fluorescent powders, microspheres, nanotubes, clays, metal powders, conductive polymers, chromophoric polymers, ceramic powders and mixtures thereof.

28. The waveguide attenuation device of claim 26 wherein said active medium includes particle thickening agents up to 50% by weight selected from the group consisting of: silicon dioxide powders, oxide powders, liquid crystals, fluorescent powders, microspheres, nanotubes, clays, metal powders, conductive polymers, chromophoric polymers, ceramic powders and mixtures thereof.